Summary Report:
Klamath Bird Observatory's 2009 Long-term Constant Effort Monitoring Station Efforts in the Klamath-Siskiyou Bioregion

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Cover photograph: Hatching-year Willow Flycatcher (*Empidonax traillii*) about to be released.

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Background

Klamath Bird Observatory (KBO) continued its comprehensive, long-term bird monitoring program in the Klamath-Siskiyou Bioregion in 2009. The objectives of this program are to collect data that provide an index to species diversity and abundance in riparian and upland habitats, to evaluate the reproductive success, survivorship, and population health of Neotropical migratory and resident birds, and to track landbird population trends.

The Klamath-Siskiyou Bioregion lies within the Partners in Flight (PIF) Pacific and Intermountain West Avifaunal Biomes. Our monitoring efforts are conducted within several habitat types; PIF describes 45 associated focal species for which conservation and monitoring efforts should be targeted (Altman 1999, 2000, CalPIF 2002, RHJV 2004, Rich et al. 2004; Tables 1*a*-1*c*). KBO's monitoring efforts are a major component of the Klamath Bird Monitoring Network, a regional program established in 1992 (Alexander et al. 2004). KBO works with the US Forest Service Redwood Sciences Laboratory and partners in the Klamath-Siskiyou Bioregion to fulfill monitoring goals defined by the National PIF Inventory and Monitoring Working Group (Hussell and Ralph 1998, Rich et al. 2004) and Oregon-Washington (Altman 1999, 2000, Altman and Bart 2000) and California PIF (CalPIF 2002, RHJV 2004) recommendations.

As a part of KBO's long-term monitoring program, we maintained efforts to track population trends and demographics with constant effort mist netting stations, breeding bird surveys, and extensive point count survey routes throughout the Bioregion. KBO continued development of its role as a support source for regional research and monitoring projects by providing technical assistance, training, and consultation to cooperating individuals, organizations, and agencies. This report provides a summary of 2009 constant effort mist netting station efforts, technical training, nocturnal bioacoustical monitoring, and banding-associated outreach and education efforts. KBO's long-term monitoring point count efforts are documented in a separate report (Stephens and Alexander 2010).

Monitoring at Constant-Effort Stations

KBO's long-term constant effort monitoring stations are designed to provide distribution, abundance, and demographic information. The methods are described in Ralph et al. (1993, 2004) and include mist net arrays, banding, area search and point count survey, vegetation survey, and soft tissue sampling (for DNA, stable isotope study, and avian influenza monitoring). KBO conducted integrated bird monitoring accordant to constant-effort station (CES) methodology at 15 CES sites in 2009.

We continued efforts at 11 CES sites that have been operated for 10 years or more, one site operated eight years, and three sites operated two-three years. All CES sites were scheduled at the onset of the landbird breeding season in Oregon, varying by altitudinal location, and continued into October, inclusive of the fall migration. The Jefferson Nature Center and Willow Wind Community Learning Center sites were operated before and after the breeding and fall migration seasons, which provided KBO with valuable community volunteer training, environmental education and public outreach opportunities (see *Technical Training* and *Outreach and Education Integrated with Banding Efforts* below). Monitoring efforts outside the breeding and fall migration seasons at these sites also provided early and late arrival and winter resident information for migratory species in southern Oregon's Rogue Valley. In addition to the 15 CES sites, a mist netting and bird banding public demonstration was conducted as part of an International Migratory Bird Day festival in Klamath Falls.

Each CES effort was scheduled for the five hours following sunrise (with the exception of the Wildlife Images CES scheduled for six hours). Exact locations of the study sites were recorded in KBO's GIS database and the physical characteristics for each site described using a location and vegetation relevé survey method recommended by Ralph et al. (1993). Detailed descriptions of all site localities are included (Table 2).

Combined constant-effort monitoring effort totals from the 16 locations include 11,015 birds of 101 species, including four subspecies, captured during 14,510.4 net hours (number of 12 meter mist nets operated multiplied by time operated in hours). During the 293 banding efforts, 524 area search surveys were completed with 159 species detected in 712 person-days (Tables 3a, 4a, 4d). The methods used gathered distribution, abundance, and/or demographic information for these species, including many identified by PIF in continental and regional habitat conservation plans as priority or focal species (Altman 1999, 2000, CalPIF 2002, RHJV 2004, Rich et al. 2004; Table 1a-1b). Point count surveys were also conducted at CES sites during the breeding season (Stephens and Alexander 2010).

KBO's long-term monitoring CES efforts were conducted in a variety of habitats; however, in the interest of a clearer presentation, we have synthesized our effort results into two broadly distinct landscapes, *Eastside Cascades Range and Klamath Basin* and *Westside Cascades and Klamath Ranges*, from the overall totals in this report. Site-specific habitat descriptions are available upon request.

Eastside Cascade Range and Klamath Basin

From May through August (breeding season), all eight Eastside Cascades Range and Klamath Basin CES stations were scheduled once every 10-day period (Period 1 beginning 1 May). In September and October (migration season), all CES sites were scheduled and operated once per week, except for the Rocky Point Cabin station which was scheduled for an increased effort frequency of thrice weekly.

At the eight eastern CES sites and the single public demonstration effort a total of 6,609 birds were captured in 7,049.4 net hours between May and October during the 136 banding efforts, representing 347 person days (Table 3a). A total of 240 area search surveys were conducted.

During the breeding season, a total of 3,718 birds were captured in 3,972.5 net hours during 77 efforts (Table 3b). A total of 126 area search surveys were completed. During the fall migration season, a total of 2,891 birds were captured in 3,064.9 net hours during 59 efforts (Table 3c). A total of 108 area search surveys were completed.

Overall, the Rocky Point Cabin site had the highest total captures, with a greater number of net hours than the other eastern sites. Rocky Point Cabin and the Antelope Creek sites had the highest capture rate (captures per net hour). The Rocky Point Cabin site had the greatest average species richness (average species captured per effort over the season). During the breeding season, the Rocky Point Cabin site had the highest total captures and greatest average species richness. The Antelope Creek and Rocky Point Cabin sites had the highest capture rates. During the fall, the Rocky Point Cabin site had the highest total captures and capture rate, and the greatest average species richness. The Veteran's Park demonstration effort was not compared to the CES site efforts.

Two unusual species were encountered at Eastside Cascades and Klamath Basin sites during CES efforts. On 20 August, an American Redstart was captured at the Antelope Creek site, determined to be a hatching-year (hatched in 2009) female. The American Redstart is considered a vagrant to extremely limited distribution in California (CDFG 2008). Several Rose-breasted Grosbeaks were observed (not captured) 15 September at the Wood River Wetland site during area search surveys. The Rose-breasted Grosbeak is considered a casual/accidental species in Oregon (Nehls 2003).

Westside Cascades and Klamath Ranges

From May through August (breeding season), all seven western CES sites were scheduled once per 10-day cycle (Period 1 beginning 1 May). These sites had an increased frequency of efforts scheduled for the fall migration season. Beginning 1 September, the Wildlife Images site was scheduled once per three-day cycle through October. All other sites were scheduled once per week September through October. The Jefferson Nature Center site was scheduled weekly in April and monthly in November and December. The Willow Wind site was scheduled weekly in January through April and thrice monthly in November and December.

At the seven western CES sites a total of 4,406 birds were captured in 7,461.0 net hours from January through December during the 157 banding efforts, representing 365 person days (Table 4a, 4d). A total of 284 area search surveys were conducted.

During the breeding season, a total of 1,701 birds were captured in 3,264.3 net hours during 70 efforts (Table 4b). A total of 123 area search surveys were completed. During the fall migration season, a total of 2,140 birds were captured in 2,819.1 net hours during 59 efforts (Table 4c). A total of 111 area search surveys were completed. During the breeding season, at the Jefferson Nature Center and Willow Wind sites, a total of 565 birds were captured in 1,368.7 net hours during 28 efforts (Table 4d). A total of 50 area search surveys were completed.

Overall, the Wildlife Images site had the highest total captures, with a greater number of net hours, and the greatest average species richness. The Horse Creek Meadow site had the highest capture rate. During the breeding season, Wildlife Images had the highest total captures and the greatest average species richness with Horse Creek Meadow with the highest capture rate. During fall, the Wildlife Images site, with the increased effort frequency, had the highest total captures. The Willow Wind Community Learning Center site had the greatest average species richness. The Horse Creek Meadow site had the highest capture rate.

Several banded birds of year-round resident species were captured at one of the three Rogue Valley sites on Bear Creek (i.e., North Mountain Park, Jefferson Nature Center, and Willow Wind) and subsequently recaptured at another. These species included Bewick's Wren, Black-capped Chickadee, Song Sparrow, and Spotted Towhee.

Tissue Sampling

Neotropical Migratory Bird Conservation Genetics and Stable Isotopes Project

Since 1999, KBO has contributed to the University of California, Los Angeles Center for Tropical Research's (CTR) Neotropical Migratory Bird Conservation Genetics and Stable Isotopes Project. The CTR is investigating the genetic structure of migratory bird populations in order to connect breeding areas in North America with wintering areas in Latin America and the Caribbean. This field of research seeks to determine the factors responsible for population declines of Neotropical songbirds that migrate between the Caribbean, Central America, Mexico, and North America. Using molecular genetic techniques (utilizing genetic material and stable isotopes obtained from a single feather from a bird), CTR researchers have been able to connect breeding and wintering populations of songbirds (*http://www.ioe.ucla.edu/CTR/*). CTR's findings provide conservation biologists with the means of correlating habitat changes with declining populations. Demographic data contributed by KBO and other monitoring programs are integral to the CTR's research efforts. In 2009, KBO collected and contributed just over 1,600 feather samples to this project.

Avian Influenza Sampling

In 2009, KBO contributed to international efforts to collect samples of avian influenza to identify transmission paths in North American migratory birds. Information derived from the samples will also be used to further the goal of developing Influenza A vaccines. Avian viruses are present within a bird's cloaca and are relatively simple to safely collect by swab insertion. The swab samples of skin cells and fecal matter are stored in a preservative, labeled and shipped to CTR for processing and analysis. These efforts are coordinated by CTR in partnership with the Institute for Bird Populations' Monitoring Avian Productivity and Survivorship (MAPS) program and the Landbird Monitoring Network of the Americas (LaMNA). KBO met sampling goals set by the MAPS and LaMNA efforts with 850 birds sampled.

Cascades-Siskiyou National Monument Avian Migrant-Resident Populations Study

In 2008, KBO initiated a study of regional altitudinal migration using stable isotopes. Isotopic ratios of carbon, hydrogen and deuterium in inert keratin tissues of feathers and toe-claw samples can be indicative of the location where these tissues were grown. Using isotope analyses, we can determine if birds that winter in the Rogue Valley breed in our surrounding mountains and/or valleys or breed elsewhere and migrate to the valley for the winter. We collected paired feather and claw samples from all age-sex classes of the wintering species Hermit Thrush, American Robin, Audubon's Yellow-rumped Warbler, Song Sparrow, Oregon Dark-eyed Junco, and Red-winged Blackbird at sites above snow-line and below snow-line proximate to the Cascade-Siskiyou National Monument. In 2009, with sampling continuing at sites below snow-line through the winter, 236 samples were collected.

Bioacoustical Monitoring

As part of KBO's regional collaboration with the U.S. Forest Service Redwood Sciences Laboratory, we continued to operate bioacoustical monitoring stations in the Klamath-Siskiyou Bioregion, in cooperation with the Cornell University's Laboratory of Ornithology (*http://www.birds.cornell.edu/brp/research/nocturnal-migrant-flight-call-research*) and the Carnegie Museum of Natural History's Powdermill Nature Reserve (*http://www.powdermill.org/bioacoustic.htm*). Most songbirds migrate at night and many species emit short audible flight notes during their active nocturnal migrations. Our bioacoustical monitoring stations record these calls at locations adjacent to select CES sites. Recordings of these notes have been used to identify and enumerate the birds flying overhead, providing another tool for monitoring populations of migratory birds. By integration and calibration of banding and bioacoustical data, it is hoped that more precise and accurate patterns of migration at a range of spatial scales can be described.

The bioacoustical monitoring stations consist of sensitive microphones, installed in weatherproof housing, connected to computers running acoustic recording software. The recording devices were operated nightly this fall at the Sevenmile Guard Station site in the Klamath Basin and at KBO's Willow Wind office in Ashland. The Redwood Sciences Laboratory established recording devices at three sites in Trinity and Humboldt counties within the Klamath Bird Monitoring Network. The recording devices were operated mid-August through late-October/early-November, inclusive of the migration season in the region.

Technical Training

In 2009, KBO continued providing technical training in bird banding methodology and bird conservation education and outreach at CES sites. KBO's monitoring program is integrated with our bird banding internship program, providing specialized training in the latest and most effective bird monitoring techniques for students and biologists. In addition to this on-going instruction, KBO has provided intensive bird banding techniques training at these sites during monitoring efforts for volunteers and professionals from the community, academia, and land management agencies.

A total of eight intern students received experiential instruction in advanced bird banding and survey techniques. The instruction is supplemented with study materials, published by the North American Banding Council, pertinent scientific literature, and regular seminars presented by KBO staff. Our international internship program is made possible through our partnerships with the Ashland Rotary Club, the Southern Oregon University International Studies Program, the USDI Forest Service International Program, and the National Park Service Park Flight Program. We also provided experiential training in banding techniques during monitoring efforts at CES sites to partnering biologists and volunteers. Visiting biologists from the Army Corps of Engineers and Chico State University (California) received intensive banding techniques training in the field. These professional-level training sessions totaled seven person days.

A banding techniques workshop was presented in July for Klamath Bird Monitoring Network cooperators and other regional researchers at KBO's Upper Klamath Lake Field Station. Participants received instruction in advanced landbird ageing and sexing techniques, standard biometrics, mist net use and maintenance, outreach and education communication skills, and general field safety principles. The workshop was attended by 23 individuals.

Within the spirit of Partners in Flight, KBO continues a commitment to international capacity building through technical training. In 2009, an international study group tour of Middle Eastern conservation leaders visited the KBO field station in the Klamath Basin. 2009 marked KBO's third year participating in the U.S. National Park Service Park Flight Program hosting a banding intern, this year from Belize. KBO also participated in three international training efforts. In February we participated in a general bird monitoring workshop in the Bahamas (Hayes-Sutton 2009). In May, we returned to the Caribbean, working with partners to co-sponsor an intensive banding workshop in Trinidad and Tobago (Alexander and Wunderle 2009); with former KBO international interns who assisted as instructors. In November we co-sponsored a second intensive banding workshop in the Madre de Dios region of Peru, coordinated by a former KBO international intern.

In a celebration of community cooperation, KBO welcomed the contributions of several local volunteers of 62 person days assisting at stations in the Ashland area while receiving training in banding skills. These individuals were especially involved in the winter months' operation of the Willow Wind site.

Toward the fulfillment of the North American Banding Council (NABC) mission of promoting sound and ethical banding principles and techniques, KBO coordinated an individual NABC Bander certification evaluation session and contributed to a group session in partnership with the U.S. Forest Service Redwood Sciences Laboratory at the Humboldt Bay Bird Observatory, in Arcata, California. From these evaluations, seven of our interns were certified at the NABC Bander level, with one also certified at the Bander Trainer level.

Outreach and Education Integrated with Banding Efforts

The continuing monitoring efforts conducted by KBO have created many effective education and outreach opportunities that have reached hundreds of students, as well as many community members. KBO's overall education and outreach accomplishments are reported separately in greater detail (Kilby and Alexander 2010).

Bird banding provides a unique opportunity to educate the public and students about birds, their environment, and the connection between science and conservation. KBO continued to offer academic and public outreach opportunities in concordance with long-term monitoring efforts. Overall, 1,102 people visited our banding sites during field trips, bird-walks, and demonstrations at CES sites and public parks. The Jefferson Nature Center, North Mountain Park, and Willow Wind sites were especially active as readily accessible outdoor classrooms and laboratories. School and community group outreach programs and presentations were scheduled at these sites. These involved 951 Kindergarten through 12th-grade students and teachers from regional schools participating in KBO's Songbirds, Science, and Schools program (Kilby and Alexander 2010). Public banding demonstrations during KBO-hosted bird walks and other outreach events resulted in 151 visitors at mist-netting sites. On 22 May, KBO biologists and interns hosted a Southern Oregon University ornithology class for field instruction in bird monitoring techniques. Discussion topics included bird capture, age- and sex-determination, and survey techniques, as well as use of such data to inform conservation and land management.

As part of the International Migratory Bird Day annual festivals at Ashland and Klamath Falls, KBO held public banding demonstrations 9 May. The Ashland demonstration was conducted at the North Mountain Park site. The Klamath Falls event was conducted at the City of Klamath Falls' Veteran's Park (Table 3c). Both of these events were well attended (Kilby and Alexander 2010). In addition, KBO interns assisted Lava Beds National Monument biologists during a bird banding demonstration at the Tule Lake Migratory Bird Festival 16 May.

Conclusion

Klamath Bird Observatory's long-term bird monitoring program utilizes multiple methods, at a landscape level, to monitor bird populations during the breeding and migration seasons. Integral components of this monitoring program are technical training and outreach efforts. Our program includes lands that are managed by the U.S. Department of Agriculture (USDA) Forest Service, U.S. Department of Interior (USDI) Bureau of Land Management, USDI Fish and Wildlife Service, USDI Bureau of Reclamation, USDI National Park Service, and others. Data resulting from these efforts are contributed to several databases including the U.S. Geological Survey North American Bird Banding Laboratory, Institute for Bird Populations' Monitoring Avian Productivity and Survivorship Program, Klamath Bird Monitoring Network, Landbird Monitoring Network of the Americas, University of California Los Angeles Center for Tropical Research's migratory bird genetics and avian influenza projects, Carnegie Museum of Natural History Powdermill Nature Reserve Bioacoustical Monitoring Program; and Cornell Laboratory of Ornithology's Avian Knowledge Network and eBird program.

We are collecting data on population trends, habitat relationships, and demographic parameters throughout the Klamath-Siskiyou Bioregion in order to identify bird conservation opportunities. Results from KBO's long-term monitoring inform multiple audiences about both bird population status and health and species response to natural and anthropogenic habitat change. Results from these efforts inform bird conservation locally, regionally, and at the national and international levels. In 2010, KBO will continue working with our partners to maintain this long-term monitoring program contributing towards implementing our mission to advance bird and habitat conservation through science, education, and effective partnerships.

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Table 1a. List of Focal Species from Partners in Flight Landbird Conservation Plans for coniferous forests of western Oregon and Washington (Altman 1999) and east-slope of the Cascade Mountains in Oregon and Washington (Altman 2000) for which the Klamath Bird Observatory gathers distribution, abundance, and demographic information at constant effort mist netting stations in southern Oregon and northern California.

Band-tailed Pigeon
Flammulated Owl
Vaux's Swift
Rufous Hummingbird
Lewis' Woodpecker
Williamson's Sapsucker
White-headed Woodpecker
Pileated Woodpecker
Olive-sided Flycatcher
Hammond's Flycatcher
Pacific-Slope Flycatcher
Hutton's Vireo
Pygmy Nuthatch
Brown Creeper
Winter Wren
Hermit Thrush
Varied Thrush
Orange-crowned Warbler
Black-throated Gray Warbler
Hermit Warbler
Wilson's Warbler
Chipping Sparrow
Lincoln's Sparrow

Table 1b. List of Partners in Flight Watch List and Stewardship Species occurring in the Pacific (5) and Intermountain West (9) Avifaunal Biomes for which the Klamath Bird Observatory gathers distribution, abundance, and demographic information at constant effort mist netting stations in southern Oregon and northern California [*Watch List Species; **Stewardship Species] (Rich et al. 2004).

Flammulated Owl*
Calliope Hummingbird*
Allen's Hummingbird*
Rufous Hummingbird*
Lewis' Woodpecker*
Red-breasted Sapsucker**
Williamson's Sapsucker**
White-headed Woodpecker*
Olive-sided Flycatcher**
Willow Flycatcher*
Dusky Flycatcher**
Pacific-slope (Western) Flycatcher**
Gray Flycatcher**
Steller's Jay**
Western Scrub-Jay**
Chestnut-backed Chickadee**
Oak Titmouse*
Winter Wren**
Varied Thrush**
Wrentit*
Black-throated Gray Warbler**
Hermit Warbler*
Green-tailed Towhee**
Fox Sparrow**
Golden-crowned Sparrow**

Table 2. List of 2009 Klamath Bird Observatory constant effort monitoring station (CES), and public demonstration (demo) sites by station code, ownership, and location [USFS = U.S. Department of Agriculture U.S. Forest Service; BLM = U.S. Department of Interior Bureau of Land Management; USFWS = U.S. Department of Interior U.S. Fish and Wildlife Service; NPS = U.S. Department of Interior National Park Service.]

Station Name	Code	Ownership	Latitude	Longitude	Location
Sevenmile Guard Station CES	7MIL	USFS, Winema NF	42º 42' 18"	122º 04' 26"	Sevenmile Creek, Winema NF, 6 miles W Fort Klamath, Klamath Co., Oregon
Antelope Creek CES	ANT1	USFS, Klamath NF	41º 29' 32"	121º 56' 21"	Antelope Creek, 7 miles SSW of Tennant, Siskiyou Co., California
Ashland Watershed CES	ASWA	USFS, Rogue River NF	42º 06' 47"	122º 39' 40"	Ashland Creek watershed, 10.9 miles SE Ashland, Oregon
Rocky Point Cabin CES	CABN	USFWS, Upper Klamath Lake NWR	42º 29' 49"	122º 04' 47"	Rocky Point, Pelican Bay, 23.0 miles NW of Klamath Falls, Klamath Co., Oregon
Horse Creek Meadow CES	HCME	USFS, Rogue River NF	42º 23' 00"	123º 40' 00"	Horse Creek Meadow, 13.0 miles W of Merlin, Josephine Co., Oregon
Jefferson Nature Center CES	JENC	City of Medford, Jefferson Nature Center	42º 17' 59"	122º 50' 28"	Jefferson Nature Center, 2.0 miles N of Phoenix, Jackson Co., Oregon
Johnson Creek CES	JOHN	BLM, Ashland Resource Area	42º 14' 53"	122º 14' 02"	Johnson Creek, 19.2 miles ENE of Ashland, Klamath Co., Oregon
North Mountain Park CES	NMTP	City of Ashland, Dept. Parks & Recreation	42º 12' 08"	122º 41' 51"	North Mountain Park, Ashland, Jackson Co., Oregon
Odessa Creek CES	ODES	USFS, Winema NF	42º 25' 45"	122º 03' 28"	Odessa Creek Campground, 19.6 miles NW of Klamath Falls, Klamath Co., Oregon
Oregon Caves CES	ORCA	NPS, Oregon Caves NM	42º 05' 37"	123º 23' 47"	Oregon Caves NM, 14.0 miles SE of Cave Junction, Josephine Co., Oregon
Frain Ranch Campground CES	TOPS	BLM, Lakeview District	42º 01' 30"	122º 06' 05"	Klamath River at Frain Ranch Campground, 10.2 miles NW of Dorris, CA, Klamath Co., O
Veteran's Park demo	VET1	City of Klamath Falls	42º 13' 08"	121º 47' 17"	Veteran's Park, north shore Lake Ewauna, Klamath Falls, Klamath Co., Oregon
Wildlife Images CES	WIIM	BLM, Medford District	42º 29' 25"	123º 28' 48"	Rogue River at Wildlife Images, 3.5 miles SW of Merlin, Josephine Co., Oregon
Williamson River CES	WILL	USFS, Winema NF	42º 39' 22"	121º 51' 08"	Williamson River Campground, 5.5 miles NNE of Chiloquin, Klamath Co., Oregon
Willow Wind CES	WIWI	Ashland School District	42º 11' 59"	122º 41' 26"	Willow Wind Community Learning Center, Ashland, Jackson Co., Oregon
Wood River Wetland CES	WOOD	BLM, Lakeview District	42º 35' 12"	121º 55' 48"	Wood River Wetland Area, Agency Lake, 3.3 miles W of Chiloquin, Klamath Co., Oregon

Table 3a. 2009 effort summary of Klamath Bird Observatory's nine Eastside Cascades & Klamath Basin constant effort monitoring (CES) and public demonstration stations by site. [STATION (BLM = U.S. Department of Interior Bureau of Land Management, KFP = City of Klamath Falls Parks Department, USFS = U.S. Department of Agriculture Forest Service, USFWS = U.S. Department of Interior Fish and Wildlife Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION (Ownership)	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
7MIL	Sevenmile Guard Station CES (USFS)	16	98	613	72	783	891.4	13.5	48.9	6.1	0.88	30	39
ANT1	Antelope Creek CES (USFS)	14	105	701	52	858	669.2	15.0	61.3	7.5	1.28	19	30
CABN	Rocky Point Cabin CES (USFWS)	27	148	1544	75	1767	1451.9	18.2	65.4	5.5	1.22	48	87
JOHN	Johnson Creek CES (BLM)	14	70	472	36	578	830.4	12.8	41.3	5.0	0.70	23	32
ODES	Odessa Creek Campground CES (USFS)	16	74	388	25	487	742.9	13.1	30.4	4.6	0.66	27	34
TOPS	Frain Ranch Campground CES (BLM)	16	120	626	51	797	784.9	15.3	49.8	7.5	1.02	32	55
VET1	Veteran's Park public demonstration (KFP)	1	1	31	0	32	19.8	12.0	32.0	1.0	1.62	0	2
WILL	Williamson River Campground CES (USFS)	16	103	397	24	524	879.1	13.1	32.8	6.4	0.60	31	33
WOOD	Wood River Wetland CES (BLM)	16	192	514	77	783	779.8	11.6	48.9	12.0	1.00	30	35
Eastside Cascades Range & Klamath Basin Totals		**136**	**911**	**5,286**	**412**	**6,609**	**7,049.4**					**240**	**347**
Westside Cascades & Klamath Ranges Totals (Table 4a)		**129**	**585**	**3,029**	**227**	**3,841**	**6,092.3**					**234**	**287**
2008 Grand Totals		**265**	**1,496**	**8,315**	**639**	**10,450**	**13,141.7**					**474**	**634**

Table 3b. 2009 effort summary of Klamath Bird Observatory's nine Eastside Cascades & Klamath Basin constant effort monitoring (CES) and public demonstration stations by site operated during the breeding season (mid-May through late-August). [STATION (BLM = U.S. Department of Interior Bureau of Land Management, KFP = City of Klamath Falls Parks Department, USFS = U.S. Department of Agriculture Forest Service, USFWS = U.S. Department of Interior Fish and Wildlife Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
7MIL	Sevenmile Guard Station CES (USFS)	10	72	360	48	480	556.4	14.1	48.00	7.20	0.86	15	27
ANT1	Antelope Creek CES (USFS)	8	79	424	38	541	369.5	16.9	67.6	9.9	1.46	9	17
CABN	Rocky Point Cabin CES (USFWS)	10	74	579	17	670	544.4	19.1	67.00	7.40	1.23	20	50
JOHN	Johnson Creek CES (BLM)	8	45	234	20	299	474.8	13.3	37.38	5.63	0.63	14	19
ODES	Odessa Creek Campground CES (USFS)	10	59	262	20	341	472.0	15.3	34.10	5.90	0.72	15	22
TOPS	Frain Ranch Campground CES (BLM)	10	104	390	34	528	501.6	16.2	52.80	10.40	1.05	16	22
VET1	Veteran's Park public demonstration (KFP)	1	1	31	0	32	19.8	12.0	32.00	1.00	1.62	0	2
WILL	Williamson River Campground CES (USFS)	10	82	218	17	317	549.1	14.5	31.70	8.20	0.58	19	21
WOOD	Wood River Wetland CES (BLM)	10	174	313	23	510	484.9	11.4	51.00	17.40	1.05	18	23
Eastside Cascades Range & Klamath Basin Totals		**77**	**690**	**2,811**	**217**	**3,718**	**3,972.5**					**126**	**203**
Westside Cascades & Klamath Ranges Totals (Table 4b)		**70**	**241**	**1,304**	**156**	**1,701**	**3,264.3**					**123**	**156**
Breeding Season Totals		**147**	**931**	**4,115**	**373**	**5,419**	**7,236.8**					**249**	**359**

Table 3c. 2009 effort summary of Klamath Bird Observatory's eight Eastside Cascades & Klamath Basin constant effort monitoring (CES) stations by site during the fall migration season (late-August through late-October). [STATION (BLM = U.S. Department of Interior Bureau of Land Management, USFS = U.S. Department of Agriculture Forest Service, USFWS = U.S. Department of Interior Fish and Wildlife Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
7MIL	Sevenmile Guard Station CES (USFS)	6	26	253	24	303	343.0	12.5	50.50	4.33	0.88	15	12
ANT1	Antelope Creek CES (USFS)	6	26	277	14	317	299.6	13.2	52.83	4.33	1.06	10	13
CABN	Rocky Point Cabin CES (USFWS)	17	74	965	58	1097	907.5	17.7	64.53	4.35	1.21	28	37
JOHN	Johnson Creek CES (BLM)	6	25	238	16	279	335.7	12.2	46.50	4.17	0.83	9	13
ODES	Odessa Creek Campground CES (USFS)	6	15	126	5	146	270.9	9.5	24.33	2.50	0.54	12	12
TOPS	Frain Ranch Campground CES (BLM)	6	16	236	17	269	283.3	13.7	44.83	2.67	0.95	10	12
WILL	Williamson River Campground CES (USFS)	6	21	179	7	207	330.0	10.7	34.50	3.50	0.63	12	12
WOOD	Wood River Wetland CES (BLM)	6	18	201	54	273	294.9	12.0	45.50	3.00	0.93	12	12
Eastside Cascades Range & Klamath Basin Totals		**59**	**221**	**2,475**	**195**	**2,891**	**3,064.9**					**108**	**123**
Westside Cascades & Klamath Ranges Totals (Table 4c)		**59**	**344**	**1,725**	**71**	**2,140**	**2,819.1**					**111**	**131**
Fall Migration Season Totals		**118**	**565**	**4,200**	**266**	**5,031**	**5,884.0**					**219**	**254**

Table 4a. 2009 effort summary of Klamath Bird Observatory's seven Westside Cascades & Klamath Ranges constant-effort monitoring (CES) stations by site. Totals for the JENC and WIWI stations do not include efforts outside the breeding and fall migration seasons (January through April and November through December; see Table 4d). [STATION (BLM = U.S. Department of Interior Bureau of Land Management, ACP = City of Ashland Department of Parks and Recreation, ASD = Ashland School District, COM = City of Medford, NPS = U.S. Department of Interior National Park Service, USFS = U.S. Department of Agriculture Forest Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION (Ownership)	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
ASWA	Ashland Watershed CES (USFS)	15	77	474	33	584	703.6	9.6	38.9	5.1	0.83	24	35
HCME	Horse Creek Meadow CES (USFS)	15	40	348	23	411	362.6	10.8	27.4	2.7	1.13	29	34
JENC*	Jefferson Nature Center CES (COM)	19	74	285	18	377	993.4	9.1	19.8	3.9	0.38	41	45
NMTP	North Mountain Park CES (ACP)	19	64	260	25	349	889.3	8.6	18.4	3.4	0.39	37	31
ORCA	Oregon Caves National Monument CES (NPS)	14	40	275	37	352	684.2	8.9	25.1	2.9	0.51	25	29
WIIM	Wildlife Images CES (BLM)	28	200	942	61	1203	1,480.0	12.9	43.0	7.1	0.81	46	64
WIWI*	Willow Wind CES (ASD)	19	90	445	30	565	979.2	10.7	29.7	4.7	0.58	32	49
Westside Cascades & Klamath Ranges Totals		**129**	**585**	**3,029**	**227**	**3,841**	**6,092.3**					**234**	**287**
Eastside Cascades Range & Klamath Basin Totals		**136**	**911**	**5,286**	**412**	**6,609**	**7,049.4**					**240**	**347**
2009 Grand Totals		**265**	**1,496**	**8,315**	**639**	**10,450**	**13,141.7**					**474**	**634**

Table 4b. 2009 effort summary of Klamath Bird Observatory's seven Westside Cascades & Klamath Ranges constant-effort monitoring (CES) stations by site for the breeding season (mid-May through late-August). [STATION (BLM = U.S. Department of Interior Bureau of Land Management, ACP = City of Ashland Department of Parks and Recreation, ASD = Ashland School District, COM = City of Medford, NPS = U.S. Department of Interior National Park Service, USFS = U.S. Department of Agriculture Forest Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
ASWA	Ashland Watershed CES (USFS)	9	43	237	23	303	428.9	10.0	33.67	4.78	0.71	14	20
HCME	Horse Creek Meadow CES (USFS)	10	32	202	17	251	249.5	10.3	25.10	3.20	1.01	18	23
JENC	Jefferson Nature Center CES (COM)	11	19	144	12	175	564.0	6.6	15.91	1.73	0.31	25	25
NMTP	North Mountain Park CES (ACP)	11	29	84	21	134	511.3	6.8	12.18	2.64	0.26	19	15
ORCA	Oregon Caves National Monument CES (NPS)	8	22	177	32	231	385.8	9.5	28.88	2.75	0.60	12	16
WIIM	Wildlife Images CES (BLM)	10	58	350	35	443	557.7	13.1	44.30	5.80	0.79	15	26
WIWI	Willow Wind CES (ASD)	11	38	110	16	164	567.1	8.0	14.91	3.45	0.29	20	31
Westside Cascades & Klamath Ranges Totals		**70**	**241**	**1,304**	**156**	**1,701**	**3,264.3**					**123**	**156**
Eastside Cascades Range & Klamath Basin Totals (Table 3b)		**77**	**690**	**2,811**	**217**	**3,718**	**3,972.5**					**126**	**203**
Breeding Season Totals		**147**	**931**	**4,115**	**373**	**5,419**	**7,236.8**					**249**	**359**

Table 4c. 2009 effort summary of Klamath Bird Observatory's seven Westside Cascades & Klamath Ranges constant effort monitoring (CES) stations by site for the fall migration season (late-August through late-October). [STATION (BLM = U.S. Department of Interior Bureau of Land Management, ACP = City of Ashland Department of Parks and Recreation, ASD = Ashland School District, COM = City of Medford, NPS = U.S. Department of Interior National Park Service, USFS = U.S. Department of Agriculture Forest Service); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
ASWA	Ashland Watershed CES (USFS)	6	34	237	10	281	274.7	9.0	46.83	5.67	1.02	10	15
HCME	Horse Creek Meadow CES (USFS)	5	8	146	6	160	113.2	11.8	32.00	1.60	1.41	11	11
JENC	Jefferson Nature Center CES (COM)	8	55	141	6	202	429.4	12.4	25.25	6.88	0.47	16	20
NMTP	North Mountain Park CES (ACP)	8	35	176	4	215	378.0	11.0	26.88	4.38	0.57	18	16
ORCA	Oregon Caves National Monument CES (NPS)	6	18	98	5	121	289.4	8.2	20.17	3.00	0.42	12	13
WIIM	Wildlife Images CES (BLM)	18	142	592	26	760	922.3	12.8	42.22	7.89	0.82	31	38
WIWI	Willow Wind CES (ASD)	8	52	335	14	401	412.1	14.5	50.13	6.50	0.97	12	18
Westside Cascades & Klamath Ranges Totals		**59**	**344**	**1,725**	**71**	**2,140**	**2,819.1**					**111**	**131**
Eastside Cascades Range & Klamath Basin Totals (Table 3c)		**59**	**221**	**2,475**	**195**	**2,891**	**3,064.9**					**108**	**123**
Fall Migration Season Totals		**118**	**565**	**4,200**	**266**	**5,031**	**5,884.0**					**219**	**254**

Table 4d. 2009 effort summary of Klamath Bird Observatory's two Westside Cascades & Klamath Ranges constant-effort monitoring (CES) stations by site operated January-April and November-December, outside the breeding and fall migration seasons. [STATION (ASD = Ashland School District, COM = City of Medford); EFFORTS = number of visits to each site; RECAP, NEW, UNBANDED and TOTAL = number of previously banded birds, newly banded birds, birds released without being banded, and total number of birds captured respectively; AVERAGE SPECIES RICHNESS = average number of species captured each day; SURVEYS = number of 20-minute area search surveys conducted; NET HOURS = number of 12 m nets operated x time operated in hours; PERSON DAYS = number of person days spent; AVERAGE DAILY CAPTURES = average total captures per day; AVERAGE DAILY RECAPS = average recaptures per day; CAPTURES PER NET HOUR = average of total captures per net hour]

STATION CODE	STATION (Ownership)	EFFORTS	RECAP	NEW	UNBANDED	TOTAL	NET HOURS	AVERAGE SPECIES RICHNESS	AVERAGE DAILY CAPTURES	AVERAGE DAILY RECAPS	CAPTURES PER NET HOUR	SURVEYS	PERSON DAYS
JENC	Jefferson Nature Center CES (COM)	9	59	135	11	205	429.6	8.2	22.8	6.6	0.48	18	25
WIWI	Willow Wind CES (ASD)	19	118	221	21	360	939.1	8.4	18.9	6.2	0.38	32	53
Outside Breeding and Fall Migration Seasons Totals		**28**	**177**	**356**	**32**	**565**	**1,368.7**					**50**	**78**